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09/623,519	11/06/2000	Masakazu Yamamoto	198006US2PCT	1057
22850 7590 01/07/2008 OBLON, SPIVAK, MCCLELLAND MAIER & NEUSTADT, P.C. 1940 DUKE STREET ALEXANDRIA, VA 22314			EXAMINER LAU, TUNG S	
			ART UNIT 2863	PAPER NUMBER
			NOTIFICATION DATE 01/07/2008	DELIVERY MODE ELECTRONIC

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

patentdocket@oblon.com  
oblonpat@oblon.com  
jgardner@oblon.com

## Office Action Summary

**Application No.**

09/623,519

**Applicant(s)**

YAMAMOTO ET AL.

**Examiner**

Tung S. Lau

**Art Unit**

2863

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 02 September 2003.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1 and 3-42 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1, 3-27, 29, 30 and 35-42 is/are rejected.
- 7) ☒ Claim(s) 28 and 31-34 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 06 November 2000 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |   |   |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)   | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)  | 5) <input type="checkbox"/> Notice of Informal Patent Application                       |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)<br>Paper No(s)/Mail Date <u>10/30/2006, 11/02/2006</u> | 6) <input type="checkbox"/> Other: _____  |

03/06/2007

## **DETAILED ACTION**

### **Reconstructed case**

1. The examiner notice the original set of claims was not complete on file, the examiner is examining the case according to the set of amended claims filed on 09/02/2003.

### **Information Disclosure Statement**

2. The information disclosure statement filed 10/30/2000 fails to comply with the provisions of 37 CFR 1.98 (a)(2) which required a legible copy. The cited documents are missing from the file (AO, AP, AQ, AR, AS, and AT).

The information disclosure statement filed 11/02/2006 fails to fully comply with 37 CFR 1.98(a)(3) because it does not include a concise explanation of the relevance, as it is presently understood by the individual designated in § 1.56(c) most knowledgeable about the content of the information, of each patent, publication, or other information listed that is not in the English language. The concise explanation may be either separate from applicant's specification or incorporated therein. See Item AO and AQ of the foreign patent Document section. It has been placed in the application file, but the information referred to therein has not been considered.

Applicant is advised that the date of any re-submission of any item of information contained in this information disclosure statement or the submission of any missing element(s) will be the date of submission for purpose of determining

compliance with the requirements based on the time of filling the statement, including all certification requirements under 37 CFR 1.97(e). See MPEP § 609.05(a).

### **Joint inventor**

3. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 C.F.R. 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

### ***Specification objections***

4. The abstract of the disclosure is objected to because it contains more than 150 words, correction is required.

It is important that the abstract not exceed 150 words in length since the space provided for the abstract on the computer tape used by the printer is limited See 37 CFR 1.72(b) and MPEP § 608.01(b). The form and legal phraseology often used in patent claims, such as "means" and "said," should be avoided. The abstract should describe the disclosure sufficiently to assist readers in deciding whether there is a need for consulting the full patent text for details.

The language should be clear and concise and should not repeat information given in the title. It should avoid using phrases which can be implied, such as, "The disclosure concerns," "The disclosure defined by this invention," "The disclosure describes," "means" and "said," etc, should be avoided (See GUIDELINES FOR THE PREPARATION OF PATENT ABSTRACTS and 608.01(b) [R-3])

***Claim Rejections - 35 USC § 102***

5. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1, 6, 9, 10, 11, 20, 22, 24, 29, 30, 35, 36, 37, 38, 39, 40, 41, 42, 3, 4, 5, 7, 12, 13, 14, 15, 16, 17, 18, 19, 23, 25, 26 and 27 are rejected under 35 U.S.C. 102(b) as being anticipated by Lorett et al. (U.S. Patent 4,678,404, Date of Patent Jul. 7, 1987).

**Regarding claim 1:**

Lorett describes a diagnostic system for fluid machinery (abstract) comprising: first identifying means for inputting prescribed data on the fluid machinery to be diagnosed and identifying the characteristics of the fluid machinery represented by flow rate-head characteristics (fig. 5, 4); second identifying means for identifying the operating flow rate (fig. 4, 5) or operating pressure of the fluid

machinery according to the relationship between the identified characteristics of the fluid machinery and a measured operating pressure or operating flow rate of the fluid machinery by operating the fluid machinery to be diagnosed and inputting the measured results of the operating pressure (head) (fig. 4, 5), operating flow rate (fig. 4, 5), power consumption, or operating electric current of the fluid machinery in operation; and processing means for computing variations in the operating flow rate, operating pressure, or power consumption while the rotational speed of the fluid machinery to be diagnosed is varied, and for displaying the computed results (fig. fig. 5):

wherein said first identifying means functions by inputting one or more of the following data (1-11) regarding the fluid machinery:

1. Diameter (or numerical order) (col. 7-8, lines 61-13) of suction port (fig. 12, 11)
2. Diameter (or numerical order) of discharge port
3. Rated output of motor driving the fluid machinery
4. Number of poles of motor driving the fluid machinery
5. Operating frequency of motor driving the fluid machinery.
6. Rating plate specifications (flow rate-head) of the fluid machinery.
7. Model name of the fluid machinery
8. Manufacturer's name of the fluid machinery
9. Number of impeller stages of the fluid machinery
10. Outer diameter of impeller of the fluid machinery

11. Test data regarding the flow rate-head and the flow rate-power consumption of the fluid machinery.

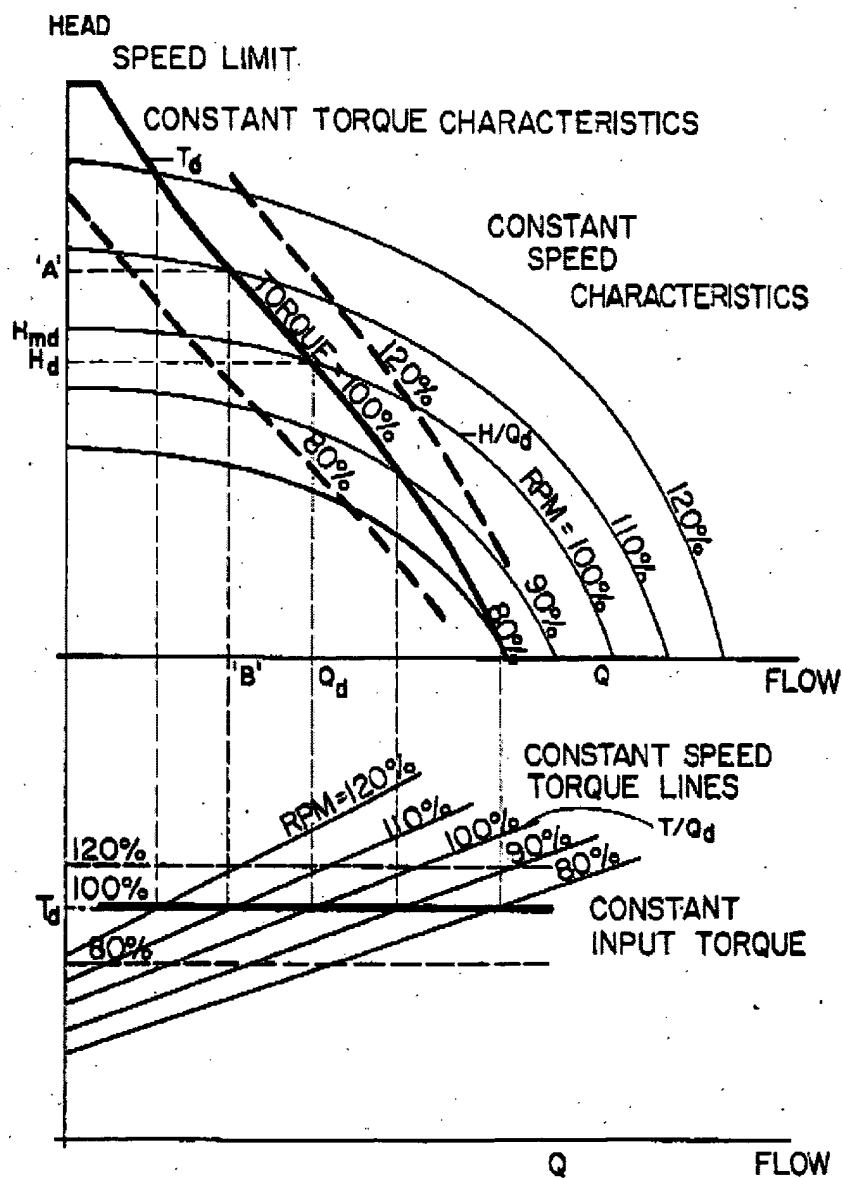


FIG. 8

Regarding claim 6:

Lorett describes a diagnostic system for fluid machinery capable of finding with high accuracy wasteful energy consumption in the fluid machinery and its peripheral devices (fig. 7, col. 1, lines 46-68), comprising: a controller (fig. 7, 75, 81) having a frequency converter as a primary component for reducing the estimate wasteful energy consumption (col. 1, lines 46-68), said controller being used in combination with first identifying means for inputting prescribed data on the fluid machinery to be diagnosed and identifying the characteristics of the fluid machinery represented by flow rate-head characteristics (fig. 6, 8, col. 1, lines 46-68); second identifying means for identifying the operating flow rate (fig. 8) or operating pressure of the fluid machinery according to the relationship between the identified characteristics of the fluid machinery and a measured operating pressure or operating flow rate of the fluid machinery by operating the fluid machinery to be diagnosed and inputting the measured results Of the operating pressure (head), operating flow rate, power consumption, or operating electric current of the fluid machinery in operation; and processing means for computing variations in the operating flow rate (fig. 8), operating pressure, or power consumption while the rotational speed of the fluid machinery to be diagnosed is varied, and for displaying the computed results (fig. 8).

**Regarding claim 9:**

Lorett describes a diagnostic system for fluid machinery (abstract) comprising: first identifying means for identifying the characteristics of the fluid machinery represented by flow rate-head characteristics of the fluid machinery to be



diagnosed (fig. 4, 5); second identifying means for identifying the actual operating point of the fluid machinery to be diagnosed (fig. 4, 5); and processing means for computing variations in the operating point when the rotational speed of the fluid machinery to be diagnosed is varied (fig. 8), and for displaying the computed results (fig. 8);

wherein said first identifying means functions by inputting one or more of the following data (1-11) regarding the fluid machinery:

1. Diameter (or numerical order) (col. 7-8, lines 61-13) of suction port (fig. 12, 11)
2. Diameter (or numerical order) of discharge port 3. Rated output of motor driving the fluid machinery
4. Number of poles of motor driving the fluid machinery
5. Operating frequency of motor driving the fluid machinery
6. Rating plate specifications (flow rate-head) of the fluid machinery
7. Model name of the fluid machinery
8. Manufacturer's name of the fluid machinery
9. Number of impeller stages of the fluid machinery
10. Outer diameter of impeller of the fluid machinery
11. Test data regarding the flow rate-head and the flow rate-power consumption of the fluid machinery.

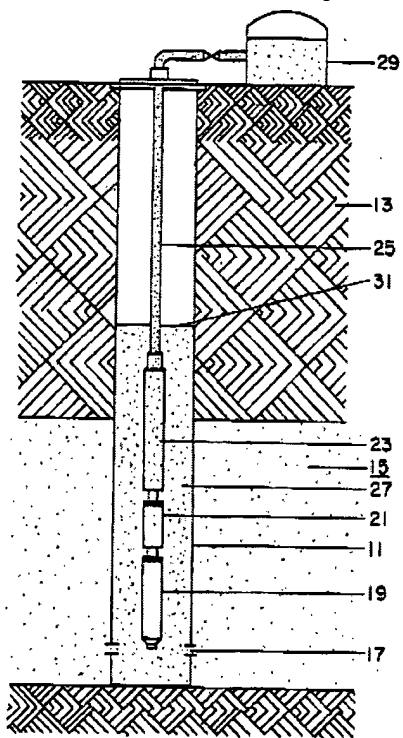


FIG. 1

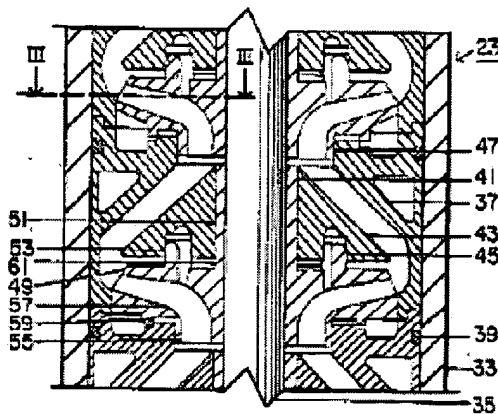


FIG. 2

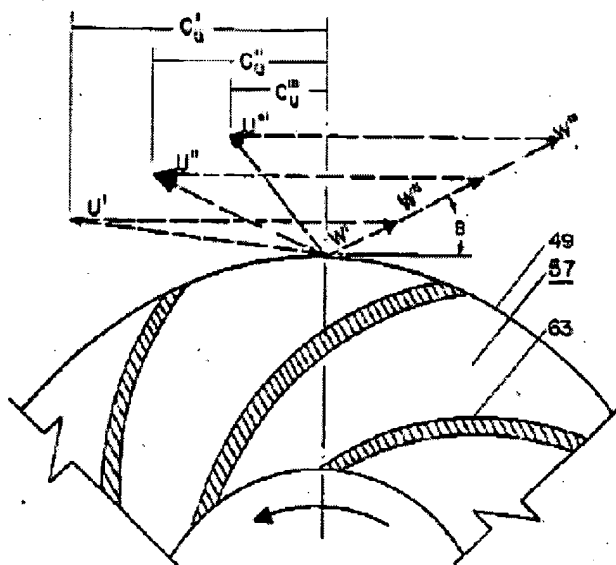


FIG. 3

**Regarding claim 10:**

Lorett describes a method for diagnosing fluid machinery (abstract) comprising:  
identifying the characteristics of the fluid machinery represented by flow rate-head characteristics of the fluid machinery to be diagnosed 9col. 1, lines 46-68);  
identifying the actual operating point of the fluid machinery to be diagnosed (fig. 4, 5); and

computing variations in the operating point when the rotational speed of the fluid machinery to be diagnosed is varied, and displaying the computed results (fig. 6, 8);

wherein said identifying the characteristics of the fluid machinery comprises inputting one or more of the following data (1-11) regarding the fluid machinery:

1. Diameter (or numerical order) (col. 7-8, lines 61-13) of suction port (fig. 12, 11)
2. Diameter (or numerical order) of discharge port
3. Rated output of motor driving the fluid machinery
4. Number of poles of motor driving the fluid machinery
5. Operating frequency of motor driving the fluid machinery
6. Rating plate specifications (flow rate-head) of the fluid machinery
7. Model name of the fluid machinery
8. Manufacturer's name of the fluid machinery
9. Number of impeller stages of the fluid machinery
10. Outer diameter of impeller of the fluid machinery
11. Test data regarding the flow rate-head and the flow rate-power consumption of the fluid machinery.

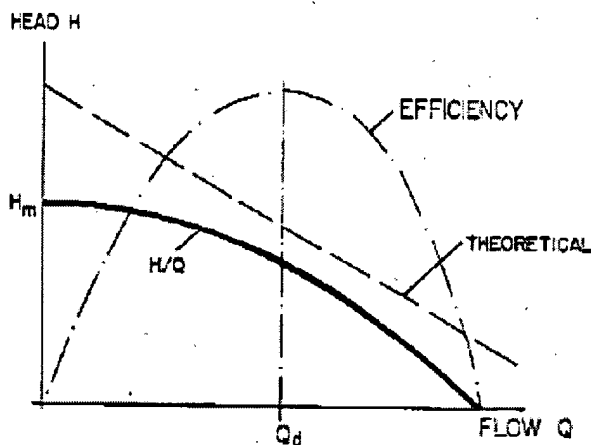


FIG. 4

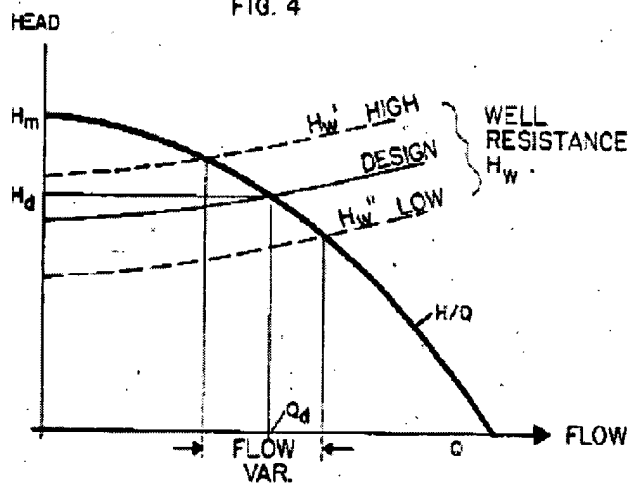


FIG. 5

**Regarding claim 11:**

Lorett describes a method for identifying characteristics of fluid machinery (abstract) comprising: calculating the head and shaft power for flow rates (col. 1, lines 46-69, col. 2, lines 41-60) by determining representative points for characteristics of fluid machinery (fig. 4, 5) including a representative head and representative shaft power (fig. 8) and by determining the ratios of head and shaft power other than the representative flow rate to the representative head

and representative shaft power based on the port diameter of the fluid machinery (fig. 12, 11) , the number of impeller stages (fig. 12, 11), and the rated output and rated rotational speed of the motor used to drive the fluid machinery (fig. 8); estimating provisional characteristics of the fluid machinery based on the calculated head and shaft power (fig. 8, col. 2, lines 41-60); and identifying characteristics of the fluid machinery and the operating point including the operating flow rate by correcting said provisional characteristics of the fluid machinery based on measurement data including at least the head and power consumption during current operations (fig. 8, col. 2, lines 41-60); wherein said calculating comprises inputting one or more of the following data (1-11) regarding the fluid machinery:

1. Diameter (or numerical order) (col. 7-8, lines 61-13) of suction port (fig. 12, 11)
2. Diameter (or numerical order) of discharge port
3. Rated output of motor driving the fluid machinery
4. Number of poles of motor driving the fluid machinery
5. Operating frequency of motor driving the fluid machine
6. Rating plate specifications (flow rate-head) of the fluid machinery
7. Model name of the fluid machinery
8. Manufacturer's name of the fluid machinery
9. Number of impeller stages of the fluid machinery
10. Outer diameter of impeller of the fluid machinery

11. Test data regarding the flow rate-head and the flow rate-power consumption of the fluid machinery.

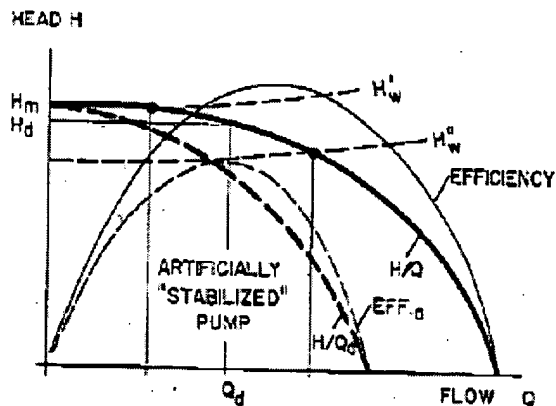


FIG. 6

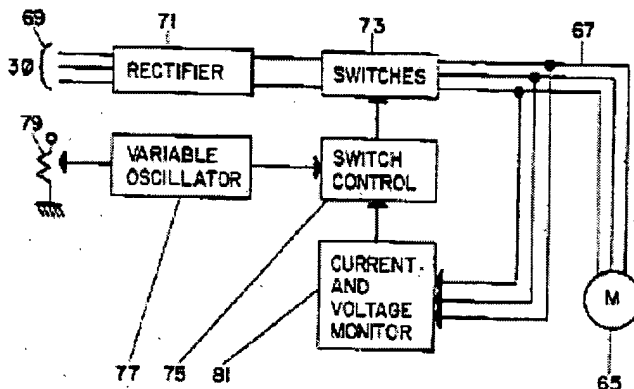


FIG. 7

**Regarding claim 20:**

Lorett describes an energy-saving pre-diagnostic system for fluid machinery (col. 1, lines 46-68), comprising: inputting means for inputting flow rate-pressure (fig. 4, 5)(head) and flow rate-power consumption data for fluid machinery having a motor driven by a commercial AC power (fig. 8, col. 1, lines 16-29, col. 2, lines

41-60), and design specifications (flow rate-pressure) in a facility side (fig. 4, 8); inputting or estimating means for inputting or estimating resistance of piping (actual head) when the flow rate is zero (fig. 5, 8, col. 4, lines 27-65); calculating means for calculating the reduction in power consumption achieved when reducing the rotational speed of the fluid machinery with a frequency converter (fig. 8, col. 2, lines 41-60); and processing means for displaying the calculated results (fig. 8).

**Regarding claim 22:**

Lorett describes a method for displaying the characteristics of fluid machinery, comprising: inputting one or more of the following data (1-11 ) regarding the fluid machinery:

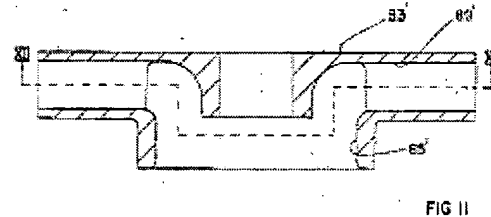
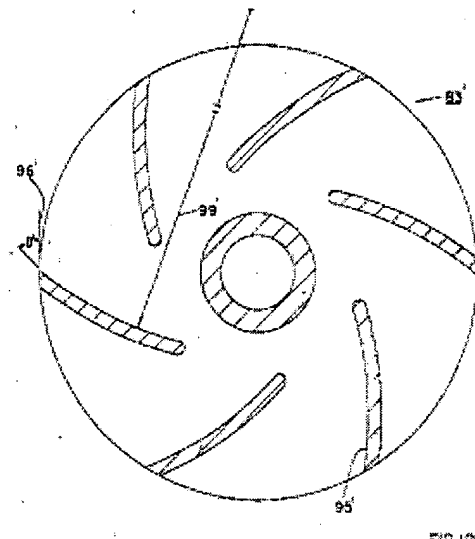
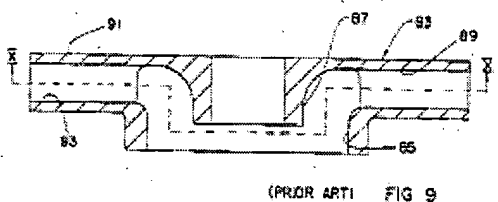
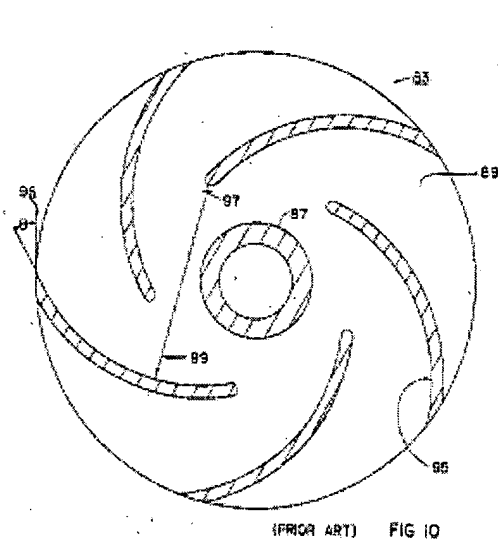
- (1) Diameter (or numerical order)(col. 7-8, lines 61-13) of suction port (fig. 12, 11)
- 2) Diameter (or numerical order) of discharge port
- (3) Rated output of motor driving the fluid machinery
- (4) Number of poles of motor driving the fluid machinery
- (5) Operating frequency of motor driving the fluid machinery
- (6) Rating plate specifications (flow rate-head) of the fluid machinery
- (7) Model name of the fluid machinery
- (8) Manufacturer's name of the fluid machinery
- (9) Number of impeller stages of the fluid machinery
- (10) Outer diameter of impeller of the fluid machinery

11) Test data regarding the flow rate-head and flow rate-power consumption of the fluid machinery;  
displaying the flow rate-pressure characteristics of the fluid machinery varied according to the rotational speed on the same surface using a plurality of curves (fig. 8); and displaying data related to the power consumption on the same surface (fig. 8).

**Regarding claim 24:**

Lorett describes a method for displaying the characteristics of fluid machinery (fig. 8) comprising: displaying the flow rate-pressure characteristics of the fluid machinery varied according to the rotational speed on the same surface using a plurality of curves (fig. 8); displaying data related to the power consumption on the same surface (fig. 8, 2); and displaying on the same surface a reference selection range under a fixed rotational speed of the fluid machinery (fig. 12, col. 7-8, lines 61-13).





**Regarding claim 29:**

Lorett describes a fluid machinery or an apparatus for varying the rotational speed of the fluid machinery, comprising:

inputting one or more of the following data (1-11) regarding the fluid machinery:

- (1) Diameter (or numerical order)(col. 7-8, lines 61-13) of suction port (fig. 12, 11)
- (2) Diameter (or numerical order) of discharge port
- (3) Rated output of motor driving the fluid machinery
- (4) Number of poles of motor driving the fluid machinery
- (5) Operating frequency of motor driving the fluid machinery
- (6) Rating plate specifications (flow rate-head) of the fluid machinery
- (7) Model name of the fluid machinery

(8) Manufacturer's name of the fluid machinery

(9) Number of impeller stages of the fluid machinery

(10) Outer diameter of impeller of the fluid machinery

(11) Test data regarding the flow rate-head and flow rate-power consumption of the fluid machinery;

displaying the flow rate-pressure characteristics of the fluid machinery varied according to the rotational speed on the same surface of a promotional material represented by a catalog (fig. 8), using a plurality of curves (fig. 8); and

displaying data related to the power consumption on the same surface (fig. 8) of said promotional material (fig. 12).

**Regarding claim 30:**

Lorett describes a line graph for the power consumption of fluid machinery comprising: a plurality of curves indicating the flow rate-pressure characteristics of fluid machinery in each of rotational speeds and displayed in a coordinate system (fig. 8, col. 2, lines 41-60); and a plurality of curves indicating the flow rate-pressure characteristics of the fluid machinery in each of values of power consumption and displayed in said coordinate system (fig. 8, col. 2, lines 41-60): wherein said line graph is obtained by inputting one or more of the following data (1- 11) regarding the fluid machinery:

1. Diameter (or numerical order)(col. 7-8, lines 61-13) of suction port (fig. 12, 11)
2. Diameter (or numerical order) of discharge port

3. Rated output of motor driving the fluid machinery
4. Number of poles of motor driving the fluid machinery
5. Operating frequency of motor driving the fluid machinery
6. Rating plate specifications (flow rate-head) of the fluid machinery
7. Model name of the fluid machinery
8. Manufacturer's name of the fluid machinery
9. Number of impeller stages of the fluid machinery
10. Outer diameter of impeller of the fluid machinery
11. Test data regarding the flow rate-head and the flow rate-power consumption of the fluid machinery.

**Regarding claim 35:**

Lorett describes an energy-saving diagnostic system for fluid machinery, comprising: a controller (fig. 7, 75) for identifying characteristics of the fluid machinery represented by flow rate-head characteristics of the fluid machinery from inputted data on the fluid machinery to be diagnosed (fig. 8), and calculating a reduction in power consumption achieved when reducing a rotational speed of the fluid machinery (fig. 8, col. 2, lines 41-60), based on the identified characteristics of the fluid machinery (fig. 1); and a storage unit for storing data for outputting the calculated reduction in power consumption (fig. 7, 75, col. 2, lines 41-60);

wherein the inputted data on the fluid machinery to be diagnosed comprises one or more of the following data (1-11) regarding the fluid machinery:

1. Diameter (or numerical order)(col. 7-8, lines 61-13) of suction port (fig. 12, 11)
2. Diameter (or numerical order) of discharge port
3. Rated output of motor driving the fluid machinery
4. Number of poles of motor driving the fluid machinery
5. Operating frequency of motor driving the fluid machinery
6. Rating plate specifications (flow rate-head) of the fluid machinery
7. Modelname of the fluid machinery
8. Manufacturer's name of the fluid machinery •
9. Number of impeller stages of the fluid machinery
10. Outer diameter of impeller of the fluid machinery
11. Test data regarding the flow rate-head and the flow rate-power Consumption of the fluid machinery.

**Regarding claim 36:**

Lorett describes a method for selecting a device for energy saving in fluid machinery (abstract), comprising: identifying characteristics of the fluid machinery represented by flow rate-head characteristics of the fluid machinery from inputted data on the fluid machinery to be diagnosed (fig. 4, 5, 6, 8); calculating a reduction in power consumption achieved when reducing a rotational speed of the fluid machinery (col. 2, lines 41-60), based on the identified characteristics of the fluid machinery (fig. 4, 5, 6, 8); and selecting a device for energy saving suitable for achieving the calculated reduction in power consumption (fig. 4, 5, 6, 8, col. 2, lines 41-60):

wherein the inputted data on the fluid machinery to be diagnosed comprises one or more of the following data (1-11) regarding the fluid machinery:

1. Diameter (or numerical order)(col. 7-8, lines 61-13) of suction port (fig. 12, 11)
2. Diameter (or numerical order) of discharge port
3. Rated output of motor driving the fluid machinery
4. Number of poles of motor driving the fluid machinery
5. Operating frequency of motor driving the fluid machinery
6. Rating plate specifications (flow rate-head) of the fluid machinery
7. Model name of the fluid machinery
8. Manufacturer's name of the fluid machinery
9. Number of impeller stages of the fluid machinery
10. Outer diameter of impeller of the fluid machinery
11. Test data regarding the flow rate-head and the flow rate-power consumption of the fluid machinery.

**Regarding claim 37:**

Lorett describes an energy-saving diagnostic system for fluid machinery (fig. 1), comprising: a controller for identifying characteristics of the fluid machinery represented by flow rate-head characteristics of the fluid machinery from data on the fluid machinery (fig. 4, 5, 6, 8), to be diagnosed 9fig. 1), inputted into a user's input device (fig. 7), and calculating a reduction in power consumption achieved when reducing a rotational speed of the fluid machinery (fig. 4, 5, 6, 8, col. 2, lines 41-60), based on the identified characteristics of the fluid machinery; and a

storage unit for storing data for outputting the calculated reduction in power consumption on a user's output device (fig. 4, 5, 6, 8, col. 2, lines 41-60); wherein the data on the fluid machinery, to be diagnosed, inputted into a user's input device comprises one or more of the following data (1-11) regarding the fluid machinery:

1. Diameter (or numerical order)(col. 7-8, lines 61-13) of suction port (fig. 12, 11)
2. Diameter (or numerical order) of discharge port
3. Rated output of motor driving the fluid machinery
4. Number of poles of motor driving the fluid machinery
5. Operating frequency of motor driving the fluid machinery
6. Rating plate specifications (flow rate-head) of the fluid machinery
7. Model name of the fluid machinery
8. Manufacturer's name of the fluid machinery
9. Number of impeller stages of the fluid machinery
10. Outer diameter of impeller of the fluid machinery
11. Test data regarding the flow rate-head and the flow rate-power consumption of the fluid machinery.

**Regarding claim 38:**

Lorett describes a method for selecting a device for energy saving in fluid machinery (fig. 1, 7), comprising: identifying characteristics of the fluid machinery represented by flow rate-head characteristics of the fluid machinery from data on the fluid machinery, to be diagnosed (fig. 4, 5, 6, 8), inputted into a user's input

device; calculating a reduction in power consumption achieved when reducing a rotational speed of the fluid machinery (fig. 4, 5, 6, 8, col. 2, lines 41-60), based on the identified characteristics of the fluid machinery (fig. 4, 5, 6, 8); and selecting a device for energy saving suitable for achieving the calculated reduction in power consumption (fig. 4, 5, 6, 8, col. 2, lines 41-60);

wherein the data on the fluid machinery, to be diagnosed, inputted into a user's input device Comprises one or more of the following data (1-11) regarding the fluid machinery:

1. Diameter (or numerical order)(col. 7-8, lines 61-13) of suction port (fig. 12, 11)
2. Diameter (or numerical order) of discharge port
3. Rated output of motor driving the fluid machinery
4. Number of poles of motor driving the fluid machinery
5. Operating frequency of motor driving the fluid machinery
6. Rating plate specifications (flow rate-head) of the fluid machinery
7. Model name of the fluid machinery
8. Manufacturer's name of the fluid machinery
9. Number of impeller stages of the fluid machinery
10. Outer diameter of impeller of the fluid machinery
11. Test data regarding the flow rate-head and the flow rate-power consumption of the fluid machinery.

**Regarding claim 39:**

Lorett describes a method for reducing power consumption and promoting energy saving in fluid machinery by incorporating a device for energy saving into the fluid machinery (col. 1, lines 46-68, col. 2, lines 41-60), the method comprising: identifying characteristics of the fluid machinery represented by flow rate-head characteristics of the fluid machinery to be diagnosed (fig. 4, 5, 6, 8); calculating a reduction in power consumption achieved when reducing a rotational speed of the fluid machinery (fig. 4, 5, 6, 8, col. 2, lines 41-60), based on the identified characteristics of the fluid machinery; and providing the calculated reduction in power consumption to a user (fig. 4, 5, 6, 8, col. 2, lines 41-60);

wherein Said identifying comprises inputting one or more of the following data (1-11) regarding the fluid machinery:

1. Diameter (or numerical order)(col. 7-8, lines 61-13) of suction port (fig. 12, 11)
2. Diameter (or numerical order) of discharge port
3. Rated output of motor driving the fluid machinery
4. Number of poles of motor driving the fluid machinery
5. Operating frequency of motor driving the fluid machinery
6. Rating plate specifications (flow rate-head) of the fluid machinery
7. Model name of the fluid machinery
8. Manufacturer's name of the fluid machinery
9. Number of impeller stages of the fluid machinery
10. Outer diameter of impeller of the fluid machinery



11. Test data regarding the flow rate-head and the flow rate-power consumption of the fluid machinery.

**Regarding claim 40:**

Lorett describes a method for reducing power consumption and promoting energy saving in fluid machinery by incorporating a device for energy saving into the fluid machinery (col. 1, lines 46-68, col. 2, lines 41-60), the method comprising: identifying characteristics of the fluid machinery represented by flow rate-head characteristics of the fluid machinery to be diagnosed (fig. 4, 5, 6, 8); refining the identified characteristics of the fluid machinery by inputting power consumption at an actual operating point (fig. 4, 5, 6, 8, col. 2, lines 41-60); calculating a reduction in power consumption achieved when reducing a rotational speed of the fluid machinery, based on the refined characteristics of the fluid machinery; and providing the calculated reduction in power consumption to a user (fig. 4, 5, 6, 8, col. 2, lines 41-60); wherein said identifying comprises inputting one or more of the following data (1-11) regarding the fluid machinery:

1. Diameter (or numerical order)(col. 7-8, lines 61-13) of suction port (fig. 12, 11)
2. Diameter (or numerical order) of discharge port
3. Rated output of motor driving the fluid machinery\_
4. Number of poles of motor driving the fluid machinery
5. Operating frequency of motor driving the fluid machinery
6. Rating plate specifications (flow rate-head) of the fluid machinery

7. Model name of the fluid machinery
8. Manufacturer's name of the fluid machinery
9. Number of impeller stages of the fluid machinery
10. Outer diameter of impeller of the fluid machinery
11. Test data regarding the flow rate-head and the flow rate-power consumption of the fluid machinery.

**Regarding claim 41:**

Lorett describes a method for reducing power consumption and promoting energy saving in fluid machinery by incorporating a device for energy saving into the fluid machinery (col. 1, lines 46-68), the method comprising: identifying characteristics of the fluid machinery represented by flow rate-head characteristics of the fluid machinery to be diagnosed (fig. 4, 5, 6, 8); calculating a reduction in power consumption achieved when reducing a rotational speed of the fluid machinery (fig. 4, 5, 6, 8, col. 2, lines 41-60), based on the identified characteristics of the fluid machinery (fig. 4, 5, 6, 8); and providing a device for energy saving to achieve the calculated reduction in power consumption to a user (fig. 4, 5, 6, 8, col. 2, lines 41-60); wherein said identifying comprises inputting one or more of the following data (1-11) regarding the fluid machinery:

1. Diameter (or numerical order)(col. 7-8, lines 61-13) of suction port (fig. 12, 11)
2. Diameter (or numerical order) of discharge port

3. Rated output of motor driving the fluid machinery
4. Number of poles of motor driving the fluid machinery\_
5. Operating frequency of motor driving the fluid machinery
6. Rating plate specifications (flow rate-head) of the fluid machinery\_
7. Model name of the fluid machinery
8. Manufacturer's name of the fluid machinery
9. Number of impeller stages of the fluid machinery
10. Outer diameter of impeller of the fluid machinery
11. Test data regarding the flow rate-head and the flow rate-power consumption of the fluid machinery.

**Regarding claim 42:**

Lorett describes a method for reducing power consumption and promoting energy saving in fluid machinery by incorporating a device for energy saving into the fluid machinery (col. 1, lines 46-68, col. 2, lines 41-60), the method comprising: identifying characteristics of the fluid machinery represented by flow rate-head characteristics of the fluid machinery to be diagnosed (fig. 4, 5, 6, 8); refining the identified characteristics of the fluid machinery by inputting a power consumption at the actual operating point; calculating a reduction in power consumption achieved when reducing a rotational speed of the fluid machinery(fig. 4, 5, 6, 8, col. 2, lines 41-60), based on the refined characteristics of the fluid machinery; and providing a device for energy saving to achieve the calculated reduction in power consumption to a user (fig. 4, 5, 6, 8, col. 2, lines

41-60);

wherein said identifying comprises inputting one or more of the following data (1-11) regarding the fluid machinery:

1. Diameter (or numerical order)(col. 7-8, lines 61-13) of suction port (fig. 12, 11)
2. Diameter (or numerical order) of discharge port
3. Rated output of motor driving the fluid machinery
4. Number of poles of motor driving the fluid machinery
5. Operating frequency of motor driving the fluid machinery
6. Rating plate specifications (flow rate-head) of the fluid machinery
7. Model name of the fluid machinery
8. Manufacturer's name of the fluid machinery
9. Number of impeller stages of the fluid machinery
10. Outer diameter of impeller of the fluid machinery
11. Test data regarding the flow rate-head and the flow rate-power consumption of the fluid machinery.

**Regarding claim 3**, Lorett further describes characteristics of the fluid machinery identified by said first identifying means are refined by inputting the power consumption at the actual operating point (fig. 4, 8).

**Regarding claim 4**, Lorett further describes characteristics of the fluid machinery identified by said first identifying means are refined by inputting the operating pressure (fig. 8, 5) and/or power consumption at the shutoff operating point separate from the actual operating point.

**Regarding claim 5**, Lorett further describes computed results obtained by said processing means are refined by inputting values of actual head 9col. 4, lines 27-51).

**Regarding claim 7**, Lorett further describes the rotational speed of the fluid machinery is varied by changing the frequency generated by said frequency converter with said controller (fig. 5,4), and the actual head or head loss caused by piping is found by comparing the operating pressure for each rotational speed when the valve is open to that when the valve is closed (fig. 8).

**Regarding claim 12**, Lorett further describes representative points are set as the flow rate producing maximum efficiency in the fluid machinery (fig. 4, col. 4, lines 1-16), the head calculated using estimated values of efficiency for the fluid machinery (col. 4, lines 1-16), and the rated output of the motor (fig. 8).

**Regarding claim 13**, Lorett further describes representative points are set as the flow rate and head calculated using at least two points of standard specifications including the flow rate and head of the fluid machinery, and the rated output of the motor (fig. 8).

**Regarding claim 14**, Lorett further describes provisional characteristics of the fluid machinery are corrected by the flow rate calculated using head and power consumption during current operations and the estimated values of efficiency for the fluid machinery and motor (fig. 8).

**Regarding claim 15**, Lorett further describes provisional characteristics of the fluid machinery are corrected by the flow rate calculated using head and power

consumption during current operations and the estimated values of efficiency for the fluid machinery and motor, and the head and power consumption during shutoff operations (col. 6, lines 12-46).

**Regarding claim 16**, Lorett further describes provisional characteristics of the fluid machinery are corrected by the flow rate calculated using head and power consumption during current operations and the estimated values of efficiency for the fluid machinery and motor, and the head and power consumption during operations when the valve is fully open (fig. 8).

**Regarding claim 17**, Lorett further describes provisional characteristics of the fluid machinery are corrected by the flow rate calculated using head and power consumption during current operations and the estimated values of efficiency for the fluid machinery and motor, and the head and power consumption during shutoff operations and during operations when the valve is fully open (fig. 8).

**Regarding claim 18**, Lorett further describes the operating point (flow rate) is identified by said provisional characteristics of the fluid machinery and the head during current operations, and said provisional characteristics are corrected by the current power consumption (fig. 8)

**Regarding claim 19**, Lorett further describes the operating point (flow rate) is identified by said provisional characteristics of the fluid machinery and the head during current operations, and said provisional characteristics are corrected by the current power consumption (fig. 5) and the power consumption when the valve is fully open (fig. 8).

**Regarding claim 23**, Lorett further describes numerically displaying data related to the power consumption adjacent to each curve representing the flow rate-pressure characteristics (fig. 8).

**Regarding claim 25**, Lorett further describes displaying on the same surface data related to the power consumption, including at least one of the energy charge or the amount of reduction in the energy charge (fig. 8).

**Regarding claim 26**, Lorett further describes displaying on the same surface at least one of the cost of the fluid machinery or the cost of the apparatus required to vary the rotational speed (fig. 8).

**Regarding claim 27**, Lorett further describes displaying on the same surface conditions for calculating data related to the power consumption (fig. 8).

### ***Claim Rejections - 35 USC § 103***

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

a. Claims 8, and 21 are rejected under 35 U.S.C. 103(a) as being unpatentable over Lorett et al. (U.S. Patent 4,678,404) in view of Konrad (U.S. Patent 5,883,489).

**Regarding claim 8:**

Lorett describes implement the functions of identifying the characteristics of the fluid machinery represented by flow rate-head characteristics by inputting prescribed data on the fluid machinery to be diagnosed (fig. 4, 5); identifying the operating flow rate or operating pressure of the fluid machinery according to the relationship between the identified characteristics and a measured operating pressure (fig. 4, 5, 6, 8) or operating flow rate of the fluid machinery by operating the fluid machinery to be diagnosed and inputting the measured results of the operating pressure (head), operating flow rate, power consumption, or operating electric current of the fluid machinery in operation; and computing variations in the operating flow rate (fig. 4, 5, 6, 8, col. 2, lines 41-60), operating pressure, or power consumption when the rotational speed of the fluid machinery to be diagnosed is varied, and displaying the computed results (fig. 4, 5, 6, 8), wherein said inputting prescribed data on the fluid machinery to be diagnosed comprises inputting (fig. 4, 5, 6, 8) one or more of the following data (1-11) regarding the fluid machinery:

1. Diameter (or numerical order) (col. 7-8, lines 61-13) of suction port (fig. 12, 11)
2. Diameter (or numerical order) of discharge port
3. Rated output of motor driving the fluid machinery\_\_
4. Number of poles of motor driving the fluid machinery
5. Operating frequency of motor driving the fluid machinery
6. Rating plate specifications (flow rate-head) of the fluid machinery
7. Model name of the fluid machinery



8. Manufacturer's name of the fluid machinery
9. Number of impeller stages of the fluid machinery
10. Outer diameter of impeller of the fluid machinery

Lorett does not describe a recording medium capable of being read by a computer for storing programs to enable the computer.

Konrad describe a recording medium capable of being read by a computer for storing programs to enable the computer (fig. 2, 42), in order to make calculation easier and faster with low cost.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Lorett to have a recording medium capable of being read by a computer for storing programs to enable the computer taught by Konrad in order to make calculation easier and faster with low cost.

**Regarding claim 21:**

Lorett describes implement the functions of: inputting flow rate-pressure (head) (fig. 8) and flow rate-power consumption data for fluid machinery having a motor driven by a commercial AC power (fig. 8, col. 1, lines 16-30, col. 2, lines 41-60), and design specifications (flow rate-pressure) in a facility side (fig. 4, 5); inputting or estimating resistance of piping (actual head) when the flow rate is zero (fig. 5, 8);

calculating the reduction of power in consumption achieved when reducing the

rotational speed of the fluid machinery with a frequency converter (fig. 5, 8); and displaying the calculated results (fig. 5, 8).

Lorett does not describe a recording medium capable of being read by a computer for storing programs to enable the computer.

Konrad describe a recording medium capable of being read by a computer for storing programs to enable the computer (fig. 2, 42), in order to make calculation easier and faster with low cost.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Lorett to have a recording medium capable of being read by a computer for storing programs to enable the computer in order to make calculation easier and faster with low cost.

35 U.S.C. 103 authorizes a rejection where, to meet the claim, it is necessary to modify a single reference or to combine it with one or more other references. After indicating that the rejection is under 35 U.S.C. 103 (in light of KSR v. Teleflex, See MPEP 706.02(j)), the examiner should set forth in the Office action:

1. the relevant teachings of the prior art relied upon, preferably with reference to the relevant column or page number(s) and line number(s) where appropriate,
2. the difference or differences in the claim over the applied reference(s),
3. the proposed modification of the applied reference(s) necessary to arrive at the claimed subject matter, and
4. an explanation >as to< why >the claimed invention would have been obvious to< one of ordinary skill in the art at the time the invention was made.

***Allowable Subject Matter***

7. Claims 28, 31, 32, 33, and 34 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all the limitation of the base claim and any intervening claims.

The following is an examiner's statement of reasons for allowance: prior art fail to teach:

**Regarding claim 28:**

A display material for displaying the characteristics of the fluid machinery using the method.

Claims 31 and 32 are objected due to their dependency on claim 28.

**Regarding claim 33:**

A computer for obtaining the display material of the line graph.

Claim 34 is objected due to their dependency on claim 33.

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

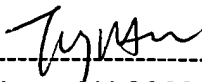
***Response to Arguments***

8. Applicant's arguments with respect to the amended claims have been considered but are moot in view of the new ground(s) of rejection. However, applicant's

arguments filed 09/02/2003 have been fully considered but they are not persuasive.

**Contact information**

9. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Tung S. Lau whose telephone number is 571-272-2274. The examiner can normally be reached on M-F 9-5:30. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, John Barlow can be reached on 571-272-2269. The fax phone numbers for the organization where this application or proceeding is assigned is 571-273-8300. Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

  
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Tung S. Lau, AU 2863  
Primary Examiner  
December 16, 2007